Association for Information Systems
AIS Electronic Library (AISeL)

PACIS 2009 Proceedings

Pacific Asia Conference on Information Systems (PACIS)

July 2009

BUSINESS AND IT ALIGNMENT; ANSWERS AND REMAINING QUESTIONS

A.J.Gilbert Silvius
Utrecht University of Applied Sciences, gilbert.silvius@hu.nl

Benny de Waal
Utrecht University of Applied Sciences, benny.dewaal@hu.nl

Jakobus Smit
Utrecht University of Applied Sciences, kobus.smit@hu.nl

BUSINESS AND IT ALIGNMENT
ANSWERS AND REMAINING QUESTIONS

A.J.Gilbert Silvius
Professor of Business, ICT and Innovation
Utrecht University of Applied Sciences
Utrecht, the Netherlands
gilbert.silvius@hu.nl

Benny de Waal
Research Group Business, ICT and Innovation
Utrecht University of Applied Sciences
Utrecht, the Netherlands
benny.dewaal@hu.nl

Jakobus Smit
Research Group Business, ICT and Innovation
Utrecht University of Applied Sciences
Utrecht, the Netherlands
kobus.smit@hu.nl

Abstract

A key success factor for a successful company in a dynamic environment is effective and efficient information technology (IT) supporting business strategies and processes. In recent surveys however IT executives consistently name IT to Business alignment their top-concern. The alignment between business needs and IT capabilities is therefore still a prominent area of concern. This paper aims to contribute to the understanding of the alignment challenge by providing an overview of the development of Business and IT Alignment, the known insights and the still to be discovered considerations We will show that the considerable number of academic studies on alignment already provides many valuable insights, but that a number of issues are not covered yet. These include

- the application of policies and strategies in more complex organisational settings, like a multi-business company or an multi-national company;

- alignment in SMEs with limited qualitative and quantitative resources;

- the relationship or 'fit' between alignment and business strategy;

- the effect of outsourced IT operations on alignment;

- the social aspects of alignment: culture, perceptions, etc.

Keywords: Business and IT Alignment; IT strategy.

1 INTRODUCTION

Information technology (IT) is changing the way companies organize their business processes, communicate with their customers and potential customers, and deliver their services. A key factor for a successful company is an effective and efficient alignment of the way IT supports business strategies and processes. The necessity and desirability of aligning business needs and IT capabilities has been examined in numerous articles (Pyburn, 1983; Reich and Benbasat, 1996; Chan et al., 1997; Luftman and Brier, 1999; Maes et al., 2000; Sabherwal and Chan, 2001) and its importance is well recognized (Cumps et al. 2006). The annual survey of top management concerns by the Society for Information Management (www.simnet.org) ranked 'IT and Business alignment' as the no. 1 concern in five of the last six years (Society of Information Management, 2003, 2004, 2005, 2006, 2007, 2008). In the year that it did not make the top spot, alignment ranked as the no. 2 concern. The alignment between business needs and IT capabilities is therefore still a prominent area of concern.

After many years of research into Business and IT Alignment (BIA), Chan and Reich (2007) list over 150 studies, the prominent position of BIA as one of the top concerns, should be surprising. Why didn't we solve the 'problem'? Should it be concluded that academic research still cannot provide solutions to the issues business and IT executives face in practice? We believe this is at least partly true. Some questions that practitioners face are not addressed in academic literature (Silvius, 2007b). This paper aims to provide an overview of what we know on BIA and what questions are still open.

After a comprehensive overview of the development of BIA, we will explore the known insights on BIA and provide some of the practical considerations that still need more research. The paper will be concluded with suggestions for further research.

2 THE CONCEPT OF BUSINESS AND IT ALIGNMENT

Although Henderson and Venkatraman are often credited for launching 'alignment' as a new concept for the 'fit' between business and IT in their Strategic Alignment Model (Henderson and Venkatraman, 1993), the challenge of 'fitting' IT solutions to business requirements is not new. Together with the rise of information systems in organizations, the need for alignment of their use with business processes and strategy has grown. Methodologies of IT planning and system development were developed as a response to this challenge, including Business Systems Planning (IBM Corporation, 1981), Information Systems Study and Information Engineering (Martin, 1982). These methodologies can be regarded as early manifestations of BIA (Chan and Reich, 2007).

Despite the apparent importance of aligning IT and business, the majority of publications are rather vague in terms of how to define or practise alignment (Maes, et al., 2000). In over a million Google hits, there are few definitions to be found. Consultants and IT companies in particular tend to use the term in unclear and probably different ways. One of the reasons for this is that the theoretical foundation of BIA is still young.

In this jungle of opinions, Chan (2002) distinguishes two prevailing conceptualizations of the alignment problem. The first one focuses on planning and objectives integration and views alignment as the degree to which the business mission, objectives and plans are supported by the IT mission, objectives and plans. This view can be found in Reich and Benbasat (1996), Kearns and Lederer (2004) and Hirschheim and Sabherwal (2001). A more holistic conceptualization of BIA can be found in Henderson and Venkatraman (1993). Their widespread framework of alignment, known as the Strategic Alignment Model, describes BIA along two dimensions (Figure 1). The dimension of strategic fit differentiates between external focus, directed towards the business environment, and internal focus, directed towards administrative structures. The other dimension of functional integration separates business and IT. Altogether, the model defines four domains that have been harmonized in order to achieve alignment. Each of these domains has its constituent components:

scope, competences, governance, infrastructure, processes and skills. Henderson and Venkatraman pay extensive attention to the different approaches of achieving this alignment. Maes et al. (2000) refine the Strategic Alignment Model by identifying three, instead of two, columns: business, information/communication and technology, and three, instead of two, rows: strategy, structure and operations.

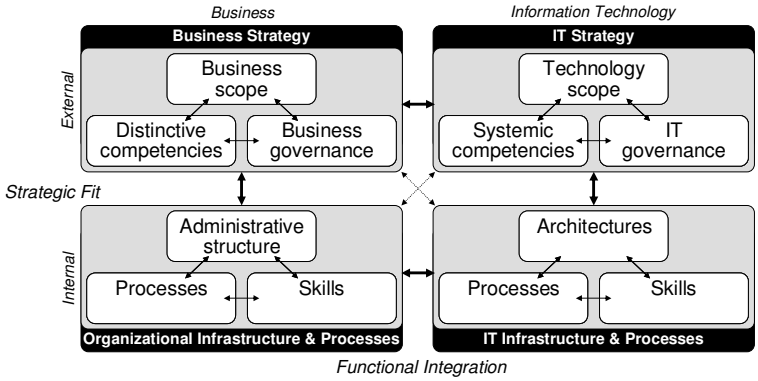

Figure 1. The 'Strategic Alignment Model'.

Following this more holistic approach, we define BA as '*the degree to which IT applications, infrastructure and organization enable and support the business strategy and processes, as well as the process to realize this.*'

3 ANALYSIS

This section analysis the known insights on BIA and identifies the questions that still need to be answered. The analysis is split into two parts. First we will analyse what is known about the question *What is the result we get from alignment?*. Secondly we will analyse the question *How to achieve alignment?*

3.1 The result of alignment

BIA refers to the alignment of business strategy, plans and priorities and IT strategy, plans and priorities (Chan and Reich, 2007). Several authors confirm that organizations that successfully align their business strategy and their IT strategy, outperform their non-aligned peers (e.g. Chan et al., 1997; Irani, 2002; Kearns and Lederer, 2004). The relationship between business strategy and IT strategy is therefore a relevant area of concern. This relationship was studied by Sabherwal and Chan (2001). In their study they used the business strategy typology developed by Miles and Snow (1978), which identifies business strategies as 'defenders' (followers, aiming to reduce costs, maximising efficiency and effectiveness of operations, while avoiding organisational change), 'prospectors' (leading innovators, reacting first on changes in the market) and 'analysers' (observants, closely watching competitor's activities and carefully evaluating changes). Table 1 shows their assessment of IT strategies that match these business strategies.

		Business strategies		
		Defenders	Prospectors	Analysers
IT strategies	IT for Efficiency	√		
	IT for Flexibility		√	
	IT for Comprehensiveness			√

Table 1. Mapping IT and Business strategies (Based on Sabherwal and Chan, 2001)

In “IT for efficiency”, IT is oriented towards internal and inter-organisational efficiencies and improved decision making. This strategy matches the defender’s business strategy well. The prospector’s strategy is best served by “IT for flexibility”, which focuses on market flexibility, time-to-market and quick decision making. The analyser’s strategy is best matched by “IT for comprehensiveness”, which allows for quick responses and comprehensive decision making, based on knowledge of market situations and other organisations.

In modern business strategy literature however, another typology is frequently used. This typology, by Treacy and Wiersema (1996), identifies three consistent potential strategies of leading companies: operational excellence, product leadership and customer intimacy (Treacy and Wiersema, 1996). In an operational excellence strategy the success of an organization is based on achieving high volumes at low costs. IT investments that create business efficiency – for example, an ERP system that optimizes the utilization of resources – are particularly relevant in this type of strategy. In a product leadership strategy, the unique selling proposition of the company is that of the high quality of its products and services. For these companies the ability of IT systems to enable this quality would therefore probably be of greater value than the efficiency of the company. Finally, in a customer intimacy strategy the organization will benefit most from IT systems that strengthen their ability to tailor what they have to offer to the customer’s needs. An example of such a system could be a customer relationship management application for a fashion retailer that allows him to record the measurements, preferences and buying history of his individual customers.

Cumps and Viaene together with PriceWaterhouseCoopers (PriceWaterhouseCoopers, 2005) use the Treacy and Wiersema typology in their study on business and IT alignment in seven West-European countries with 640 respondents. For the classification of IT strategies of the organizations they used the typology ‘Conservative’ – ‘Essential’ – ‘Innovative’ (Silvius, 2009). From this study it can be concluded that all IT strategies can be relevant to all business strategies. Some combinations, however, seem to be more obvious than others. In an Operational Excellence strategy, the Conservative and Essential IT strategies seem to be dominant, with the Innovative strategy underrepresented. In a Customer Intimacy strategy, the dominant IT strategies are also Conservative and Essential, but in opposite order. Also the Innovative strategy is relatively more present in this business strategy. In the Product Leadership strategy the dominant IT strategy is Essential, with the Conservative strategy clearly underrepresented.

A practical issue with aligning IT to business strategy is caused by the increasing dynamics in markets. Organizations are continuously adapting to changes in their environment (Silvius, 2009b). Changes in market circumstances, in technology, in customer preferences, etc. Because of this continuous process of change, business strategy is quite often not a clear target. A strategy is therefore not a destiny that is ever reached. It provides a direction, not a destiny (Silvius, 2007b). The implementation of business strategies in processes, structures, organization, resources, etc. is therefore also a continuous process. Several authors have emphasized that alignment is also a process, rather than a ‘state’ (Parker et al., 1988; Niederman et al., 1991; Baets et al., 1998). Weill and Broadbent (1998) also support the process view when they state “Alignment is a journey, not an event”. The state view on alignment can be found in Chan et al. (1997) and Bergeron et al. (2004). Luftman (2000), too, approaches BIA as a measurable ‘state’ in his Business and IT Alignment Maturity model. Since its publication, the application of Luftman’s maturity model has been reported by several authors (Ekstedt et al., 2005, Cumps et al., 2006; De Haes and Van Grembergen, 2008; Luftman, 2007). Although a representative of the state view on alignment, Luftman connects the two perspectives when he states, “The endless, quicksilver shifting of business strategies and technology makes aligning them as difficult as surveying sand dunes in the Sahara. Organizations must draw ‘a line’ in the sand, however, and continuously ensure that the process for aligning IT and business is appropriately managed.” (Luftman, 2003).

The relationship between IT and business strategy becomes even more complex in organizations that have activities in distinctly different markets. It can be expected that the majority of large organizations can be classified as such a ‘multi-business company’ (MBC). In an MBC, the different divisions or working companies operate on different markets. A practical issue for these CIOs is that the IT department serves different business divisions with different business dynamics. These

businesses differ in characteristics, business cycles, market growth, market typology, etc. and therefore differ in their business needs. The 1-to-1 relationship between IT and business, assumed in formal IT planning and BIA methodologies, appeared in the MBCs to be a 1-to-1 relationship (Silvius, 2007). Each business division has its own business requirements, but the IT requires standards to be cost-effective.

The debate on whether IT can create a competitive advantage to organizations seems to have been settled on the conclusion that this type of competitive advantage, if any, will be short-lived, and thus not sustainable, if it solely results from the deployment of superior tech\ology (Cumps et al., 2006; Clemons, and Row, 1991; Weill and Broadbent, 1998). This is because of the well developed market for IT solutions, that makes any solution, once deployed as a strategic advantage, easily available for competitors in the market place. It has therefore been suggested that the competitive value of IT results not from the technology itself, but from the management and alignment of it (Earl, 1989; Kean, 1993; Henderson and Venkatraman, 1993; Broadbent and Weill, 1993). The alignment capability, how to achieve alignment, therefore is a relevant factor in the success of the combination of business and IT strategy.

3.2 How to achieve alignment?

Contrary to the approach of the IT planning methodologies, aligning IT to business is not just a methodological process (Silvius, 2007b). Alignment requires processes, structures, capabilities, relationships (Keen, 1991) and strategies. This multidimensionality is illustrated Luftman's Business and IT Alignment Maturity model. Based on the components of the strategic alignment model (Figure 1) and his research in enablers and inhibitors of BIA (Luftman et al., 1999), Luftman recognizes six criteria for, or building blocks of, the maturity of alignment of IT and business (Luftman, 2000). These criteria are described in Table 2.

BIA maturity variable	**Description**
Communication	How well do technical and business staff understand each other? Do they connect easily and frequently? Does the company communicate effectively with consultants, vendors and partners? Does it disseminate organizational learning internally?
Value measurement	How well does the company measure its own performance and the value of its projects? After projects are completed, do they evaluate what went right and what went wrong? Do they improve the internal processes so that the next project will be better?
Governance	Do the projects that are undertaken flow from an understanding of the business strategy? Do they support that strategy? Does the organization have transparency and accountability for outcomes of IT projects?
Partnership	To what extent have business and IT departments forged true partnerships based on mutual trust and sharing risks and rewards?
Scope & Architecture	To what extent has technology evolved to become more than just business support? How has it helped the business to grow, compete and profit?
Skills	Do the staff have the skills needed to be effective? How well do the technical staff understand business drivers and speak the language of the business? How well do the business staff understand relevant technology concepts?

Table 2. BIA maturity variables.

These variables can be assessed on a five-level maturity scale, ranking from an 'Ad Hoc Process' to an 'Optimized Process'.

Based on an assessment of alignment capability in 197 organizations, Luftman (2007) reports there is no 'silver bullit' to achieving alignment. A mature alignment between business and IT requires the balanced development of all six building blocks. No single one can be left out.

Luftman's model provides a comprehensive overview of the building blocks of alignment and a good insight into the characteristics of the different levels of maturity. However, what it does not provide

are specific interventions for developing from one maturity level to a higher one, given a certain organisational context. *Practical interventions require not just an understanding of what influences alignment, but also of how alignment is influenced. Bridging the gap between BIA in theory and in practice would therefore require more research on the adoption of theoretical insights to organizational contingencies.*

It is for this reason that we adopted Luftman's model as a framework for analysing the known insights and remaining questions on how alignment can be achieved. The following paragraphs will therefore explore the knowledge on Luftman's six variables one by one.

3.2.1 Communication

Effective communication is a key element of alignment. Kaplan and Norton (2004) observe that an organization can be considered as "aligned when all employees have commonality of purpose, a shared vision, and an understanding of how their personal roles support the overall strategy.". Sharing and commonality of views between business and IT management and employees can only be established by active communication of each other's needs, vision, values, goals and methods (Segars and Grover, 1998). Reich and Benbasat (2000) reported that one of the most important predictors of alignment was a high level of communications between IT and business executives. This observation is strengthened by Parise and Henderson (2001), that note that "success in business collaboration relies on sharing and exchanging of tacit resources, such as knowledge and life-long personal expertise of employees, that is difficult to formalize, communicate, transfer and imitate, and as such are of intrinsic strategic value to the organisation".

Effective communication in organisations requires structures and processes of communication. One of the most familiar process frameworks that structures the communication between business and IT is the Information Technology Infrastructure Library (ITIL). ITIL is a set of concepts and policies for managing IT infrastructure, development and operations. It provides a detailed description of a number of important IT practices with comprehensive checklists, tasks and procedures that can be tailored to any IT organization. In its latest version, ITIL v3, which became available in May 2007, the scope of the framework is extended to IT services in general. ITIL is often considered alongside other best practice frameworks such as the Information Services Procurement Library (ISPL), the Application Services Library (ASL), Dynamic Systems Development Method (DSDM), the Capability Maturity Model (CMM/CMMI), and is often linked with IT governance through Control Objectives for Information and related Technology (COBIT). These best practice based frameworks provide useful insights, but often also a 'one size fits all' approach. *More research is required to understand which insights apply to which organisational circumstances.*

Structures, frameworks and processes create the opportunities for communication, but the use of these opportunities and therefore the effectiveness of communication is determined by human interaction. Cybulski and Lukaitis (2005) found several issues that impact communication between business and IT professionals: Business is too busy to understand IT, Outsourcing impacts communication and understanding, Scope creep as the beginning of dialogue, Trust as promoting understanding, Language and nomenclature used in communication and Better IT understanding of the business. Also Dale (2004) notes that communication between business and IT professionals is not straightforward and often clouded. The tensions between all participants commonly make communication into impassioned negotiations and consensus making, that makes it difficult to manage expectations. To remove these tensions, face-to-face encounters between IT and business professionals, should be pursued.

Interpersonal communication and cooperation is also influenced by shared values and beliefs of the participants, and thus by cultures. For example, national culture influences the way IT is perceived or used. Several authors (Batenburg, 2007; Birgelen et al., 2002; Livonen et al., 1998; Png et al., 2001; Straub et al., 1997) found proof of this in their studies. All of these studies show a certain impact of national cultures in the perception and use of IT. Given these findings it is to be expected that culture also influences the alignment of IT and business. This influence is explored by Silvius (2008). *Also here more research is needed to understand the impact of specific aspects of cultures on alignment.*

Next to national cultures, it should also be expected that corporate cultures will impact communication and therefore alignment. Kitchell (1995) found proof for the impact of corporate culture on technology adoption strategies. Similarly, McRary (1995) showed that corporate culture influences IT implementation strategies. Grover, et al. (1998) showed that a planning culture influences IT investment strategies. Grote and Baitsch (1991) found considerable cultural differences in network use for communication that could be attributed to cultural differences. *Again, more research is needed to provide practitioners with practical insights on the impact of organisational cultures.*

3.2.2 Value measurement

Alignment should pay-off and does pay-off. As found in section 3.1, several authors confirm that organizations that successfully align business and IT, outperform their non-aligned. Luftman (2007) recently confirmed this relationship between alignment and firm performance, citing two research projects, one in pharmaceuticals (Nash, 2005) and the other in banking (in progress).

Value may be a result of BIA, however, being able to demonstrate value is a building block of alignment maturity. This value of IT is much debated theme. Several surveys indicate that the issue of measuring benefits of IT investments is a concern in many organizations (Whitling et al, 1996). Measuring IT benefits and value is frequently reported as one of the most important issues for senior IT management. (Brancheau & Wetherbe, 1987; Niederman, Brancheau & Wetherbe, 1991). Based on these notion, researchers and practitioners have created numerous models and valuation methods to capture this value (Frisk, 2007). Without claiming to be complete, Renkema en Berghout (1996) listed over 50 methods, and many more have been added since than.

The conclusion from these studies must be that IT can be a driver of value, but that organizational change is required if any benefits are to be realized (Stefanoue, 2001). Value therefore depends on the organisational context and on the IT investment, project or asset on hand. According to Kefi (2002), it is important to match the IT investments to the strategic context of the organization. This notion is confirmed by Stewart and Mohamed (2002), Love and Irani (2004), Gemmell and Pagano (2003).

Another conclusion is that value is not always quantifiable in monetary terms. The so-called multi-criteria methods therefore can be seen as are a reaction to the problems of capturing the full value of IT investments in just financial metrics. These methods aim to identify different relevant aspects of value and risk in order to enable a thorough discussion and an informed discussion (Frisk, 2007). The most important method using multiple criteria is information economics (Parker, Benson & Trainor, 1988). This method is suited for evaluating a single project as well as a portfolio of projects.

Silvius (2008b) notes that the characteristics of the investment, project or asset on hand, are normally not matched by the characteristics of the evaluation method. He suggests a conceptual decision model for selecting the appropriate evaluation method, based on a simple set of characteristics of the investment, rather than trying to evaluate incomparable investments with the same criteria. *The relationship between the characteristics of the investment and the ability of an evaluation method to capture its value needs further exploration.*

In the quest for the most complete evaluation method, Nijland (2004) makes the interesting observation that more advanced methods are hardly used. In his study, he found that managers only use methods they intuitively understand. This gives input to the idea that managers may not be looking for the precise value (or cost) of IT, but for the 'right' value/cost. 'Right' in this context meaning 'the best on the market'. This may also explain the popularity of concepts like 'total cost of ownership' (TCO) that not only measured the life-time costs of an assets, but also benchmarked these costs to the market 'best practice'. As understandable as this approach may be, it leads the focus of IT valuation more to the cost side than to the benefits side.

3.2.3 Governance

IT Governance, or the business governance of IT, is aimed at ensuring that IT investments and use are aligned with business strategy and in compliance with rules and regulations. Van Grembergen and De Haes (2008) define IT Governance as "the organizational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensuring the fusion of business and IT". It Governance therefore is one of the building blocks of alignment and alignment is one of the goals of IT governance (the other one being compliancy). More specific, IT Governance are the structures, processes and relational mechanisms that enable an organisation to align business and IT.

In a study of the relationship between IT governance and BIA, De Haes and Van Grembergen (2008) found that organisations that have mature IT governance practices, also have a higher level of alignment maturity, compared to organisations with less mature governance practices. The maturity of IT governance and BIA therefore seems to be correlated.
Weill and Ross (2004) studied one of the key elements of IT governance, the decision making structure. They identified five key decisions regarding IT.

- IT principles,
  High level statements about how IT is used in the business;
- IT architecture,
  An integrated set of technical choices, policies and rules for the use of IT, to guide the organisation in satisfying business needs;
- IT infrastructure strategies,
  Centrally coordinated strategies for the base foundation of IT, as shared throughout the organisation as a reliable services;
- Business application needs,
  Specifying the business needs for IT applications and systems;
- IT investment and prioritization,
  Decisions about IT investments, including project prioritization and justification.

Based on a study of decision making styles and policies in 256 organisations, they discovered three successful IT governance models:

1. Profit and Growth,
   Centralized decision making, driven by the business, based on decentralized specified needs.
2. Return on Assets,
   Centralized decision making by IT, based on prioritization by the business.
3. A mixed model,
   Consisting of duopolic decision making by business and IT together, on most issues..

Further research may be needed on the 'fit' between governance model, business strategy and organisational contingencies.

3.2.4 Partnership

Perhaps the most intangible 'pillar' of alignment is partnership. It covers the shared visions, perceptions and goals of business and IT executives. A traditional discussion in alignment research is whether alignment is one-way, IT to business, or two-way, with IT and business mutually influencing each other. The traditional methodologies of IT planning described earlier typically consider business as leading to IT. This view can also be found in Wieringa et al. (2005). A more holistic view on alignment can be found with Henderson and Venkatraman (1993) and Poels (2006). This view of a mutual influence between business and IT prevails in today's thinking about BIA. Chan and Huff (1993) state that it is necessary for IT to challenge the business, not simply implement its vision.

The perception of the role that IT plays in business is also the underlying question of the typology of IT strategies mentioned in section 3.1. This typology is constructed as a framework that distinguishes how (senior) management perceive the impact of IT. This impact can be on the external positioning of

the organization and/or on the internal business processes (Silvius, 2006). Given a 'high' or 'low' perception of the internal and/or external impact, the different IT strategies can be categorized as follows (Figure 2). (A similar view is found with the three BIA profiles: Technical Resource, Business Enabler and Strategic Weapon, that Weiss et al. (2006) identify.)

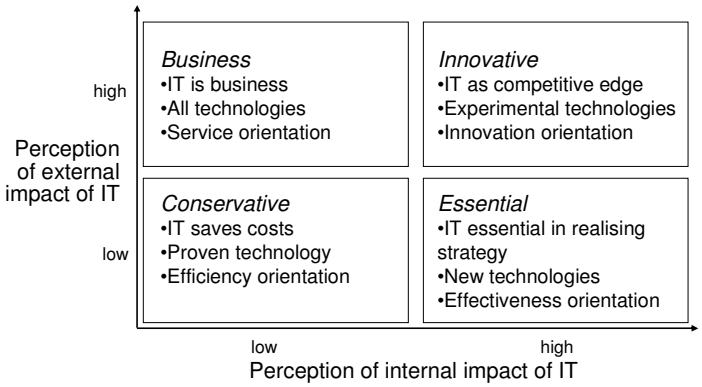

Figure 2. A typology of IT strategies(Silvius, 2009)

Cumps and Viaene (in PriceWaterhouseCoopers, 2005) studied the relationship between IT strategy and alignment capability in a survey in seven Western European countries with 640 respondents. In their study a conservative IT strategy paired consistently with a low alignment capability whereas an essential or innovative IT strategy paired with a relatively high alignment capability. Silvius (2009) built upon their results, to find a relationship between IT strategy and alignment. Figure 3 illustrates the relationship that could be constructed from these studies (Silvius, 2009).

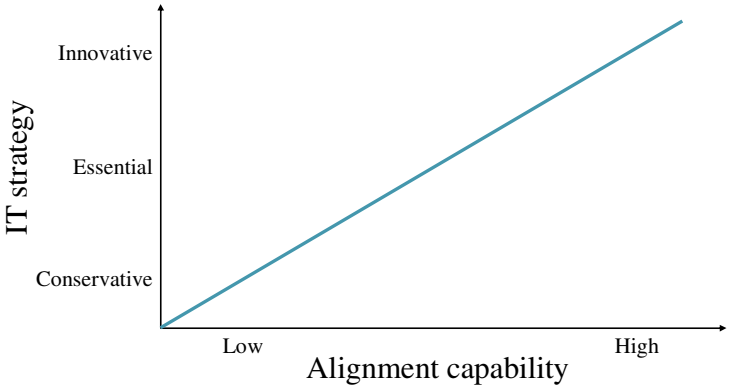

Figure 3. The relationship between IT strategy and alignment capability

This relationship shows that relationship maturity, translated in mutual perceptions of the impact of IT on business, correlates with BIA maturity. It doesn't show, however, the causality of this relationship. *Does alignment maturity cause a more innovative perception of the impact of IT or the other way around?*

Studies by Luftman (2007) and Silvius (2007c) show that the perceptions of BIA maturity of business professionals and IT staff may differ. Business executives tend to score alignment higher than IT executives. Silvius (2009) also suggests that the difference in perception of business professionals and IT staff may correlate with the BIA maturity level of the organisation. More mature alignment also suggests more consensus about the level of maturity.

Perceptions and partnership may also be influenced by the ongoing trend of IT outsourcing. Van Lier and Dohmen (2007) notice that "strategic alignment is usually the terrain of intra-organizational management". Outsourcing of (part of) the IT operations alters this. "As a result, strategic alignment becomes harder to achieve and control, taking more time and energy to arrange satisfactory."(Van Lier and Dohmen, 2007) *Also this area needs further research.*

3.2.5 Scope and Architecture

The role of business, process, IT, information and/or data architectures in alignment was already identified in the IT planning methodologies described in section 2.1. Also Galliers et al. (1994), Maes et al. (2000) and Goedvolk et al. (1997) discuss the role of architectures in alignment. The overall conclusion of these works is that an architectural approach towards the design of business processes, information systems and IT structures is instrumental in the realization of alignment of business and IT. Luftman (2007) acknowledges this vision, but also notes that architecture alone is not enough.

Another aspect of this building block of BIA is the scope of these architectures. What are the boundaries that are taken into account when aligning business and IT? In a way this question is already answered in the typology of IT strategies in section 3.2.4. Underlying this typology is the perception of the scope of impact of IT in the organisation.

Another aspect of 'scope' is the question whether alignment is aimed for on the level of part of an organisation (e.g. a business unit or a division), the level of the organisation as a whole or the level of the organization and its external partners (the 'extended enterprise')? While the logical level of consideration may, on first glance, be the organisation, Luftman (2000) suggests that the highest level of alignment maturity is reached when the scope of IT is the organisation and its external partners. *The desired level of influence of external stakeholders on alignment is, however, still unexplored.*

Silvius (2007) points out that in a multi-business organization, alignment of business and IT within a market division or business unit may collide with alignment on a central level.

3.2.6 Skills

This building-block of BIA illustrates that visions, strategies, structures and processes will not lead to successful alignment if the ability to execute is not mature. This ability to execute includes the skills and competences of both the organisation as a whole and the individual professionals, to perform and deliver. The importance of knowledge in the alignment of business and IT is confirmed by Basselier and Benbasat (2007).

Regarding the competences of the individual IT professionals, there seems to be a growing awareness that next to being competent in the technical aspects of his job, a modern IT professional also needs social skills and business knowledge, in order to be able to continue to add value to the business of his or her organization. Morneau (2006) stated: "The changing landscape of information technology and security is calling for IT professionals with a strong mix of business and technological acumen.". A similar development is identified by Silvius and Batenburg (2009), for a specific group of professionals, project managers. In his study, the importance of behavioural and contextual competences is expected to increase more than the importance of technical competences.
The ambition of IT professionals to have more knowledge of business is understandable and constructive, but also insufficient (Duedahl et al, 2005). Luftman et al. (1999) identifies as some of the top ranking enablers of alignment: "support from non-IT executives", "business understands IT" and non-IT executives that recognize the value of IT and are able to define and communicate vision and strategies that include IT. These enablers require business professionals to acquire understanding of the opportunities that IT offers to business and therefore also a certain level of IT competence. Bassellier et al. (2001) define IT competence as "The set of IT-related explicit and tacit knowledge that a business manager possesses that enables him or her to exhibit IT leadership in his or her area of business". Duedahl et al. (2005) elaborated on this study and constructed a model of the competences a business manager needs to have for a better understanding of IT. *This 'IT savvy' business professional, however, is still underrepresented in senior management positions.*

This development has implications for individual professionals, but also for organisations and for educators. Educators may need to redesign their curricula to match the required competences of the 'new' IT professional and the 'IT savvy' business professional. For organisations, this development means that they have to include also trainings and courses on soft skills and business knowledge in the

development plans of their professionals. For larger organisations this may be just an addition to their human resources policies, but for smaller organisations, it becomes even more difficult to maintain their competence in this field. Small and medium enterprises (SMEs) lack the scale to employ high-quality specialists and therefore the knowledge to align business and IT (Yamamoto Krammer, 2003). BIA therefore becomes the additional responsibility of a 'handyman' in the company who can work with computers. System management is usually carried out on an ad hoc basis, where crises are dealt with as and when they arose. This crisis-driven reactive policy is a long way from implementing a consistent IT strategy that supports the business strategy and provides more business value through better budget planning, continuity of support, better utilization of IT and increased productivity. The combination of these reasons, together with the horror stories about catastrophic IT implementations and the financial risk involved, makes SME entrepreneurs reluctant to invest in innovative IT applications. *These typical aspects of SMEs are not addressed in BIA literature.*

4 CONCLUSIONS

Aligning IT to business needs is still an important challenge for many organizations. The numerous studies on alignment provide many valuable insights. These insights are analyzed in the previous sections. However, given specific organizational contingencies, the practical application of these insights is a field that is yet to be explored. This paper has also identified a number of aspects of alignment that have not yet been covered. These include

- the application of policies and strategies in more complex organisational settings, like a multi-business company or an multi-national company;
- alignment in SMEs with limited qualitative and quantitative resources;
- the relationship or 'fit' between alignment and business strategy;
- the effect of outsourced IT operations on alignment;
- the social aspects of alignment: culture, perceptions, etc.

The overview presented in this paper aims to provide both academics and practitioners a guide to further development of the knowledge of BIA. After six years of being a major concern for executives, it should be the first priority for creating a better understanding of how IT enables or innovates business. This last aspect especially makes this understanding a must for both IT and business professionals. The future success of organizations depends on their ability to innovate and improve their businesses continuously. IT is the key to doing this and therefore the key to a successful future.

References

Bassellier, G., Reich, B.H. & Benbasat, I. (2001) 'Information technology competence of Business managers: a definition and research model', Journal of Management Information Systems, 17, 4, 2001, 159-182.

Bassellier, G., & Benbasat, I. (2007) 'Assessing the Contributions of Business and IT Knowledge to the Development of IT/business Partnerships', Proceedings of the ACM SIGMIS CPR conference on Computer personnel research.

Batenburg, R. (2007), 'E-procurement adoption by European Firms: A quantative analysis', Journal of Purchasing & Supply Management, 13, 182-192.

Baets, W.R.J. & Galliers, R.D. (eds.) (1998). Information Technology and Organizational Transformation, New York: John Wiley and Sons.

Bergeron, F., Raymond, L. & RIvard, S. (2004). Ideal Patterns of Strategic Alignment and Business Performance, Information & Management 41(8): 1003-1020.

Birgelen, M. van, Ruyter, K.D, Jong, A.D., & Wtzels, M. (2002). 'Customer evaluations of after-sale service contact modes: An empirical analysis of national culture's consequences'. International Journal of Research in Marketing, 19, 43-64.

Brancheau, J.C., & Wetherbe, J.C. (1987). 'Key Issues in Information Systems Management', MIS Quarterly, 11(1), pp. 23 - 45.

Chan, Y.E. & Huff, S.L. (1993), 'Investigating Information Systems Strategic Alignment', Proceedings on the Fourteenth International Conference on Information Systems, Orlando, FL. 345-363.

Chan, Y.E., Huff, S.L., Barclay, D.W. & Copeland, D.G. (1997), 'Business Strategy Orientation, Information Systems Orientation and Strategic Alignment,' Information Systems Research, Vol. 8, No. 2, pp. 125-150.

Chan, Y.E. (2002), 'Why Haven't we Mastered Alignment? The Importance of the Informal Organization Structure.' MIS Quarterly Executive, Vol. 1, No. 2.

Chan, Y.E. & Reich, B.H. (2007), 'IT alignment: what have we learned', Journal of Information Technology advance online publication, 18 September 2007; doi: 10.1057/palgrave.jit.2000109.

Cumps, B., Viaene, S., Dedene, G, & Vandenbulcke, J. (2006), 'An Empirical Study on Business/ICT Alignment in European Organisations', 39th Hawaii International Conference on Systems Science (HICSS-39), Waikoloa, Big Island, HI, USA,

Cumps, B., Martens, D., De Backer, M., Haesen, R., Viaene, S., Dedene, G., Baesensd, B., & Snoecka, M. (2006), 'Predicting Business/ICT Alignment with AntMiner+', KBI0708, Research paper Department of Decision Sciences and Information Management (KBI), Catholic University of Leuven.

Cybulski, J. and Lukaitic, S. (2005), 'The Impact of Communications and Understanding on the Success of Business / IT Alignment?', 16th Australasian Conference on Information Systems (ACIS-2005), Sydney.

Dale, M. (2004), 'Defining User Requirements for a Large Corporate Data Warehouse: An Experiential Case Study', in 9th Australian Workshop on Requirements Engineering: University of South Australia. p. 5.1-5.11.

De Haes, S. & Van Grembergen, W. (2008), 'Analysing the Relationship Between IT Governance and Business/IT Alignment', 41st Hawaii International Conference on Systems Science (HICSS-41), Waikoloa, Big Island, HI, USA.

Duedahl, M., Andersen, J. & Sein, M.K. (2005) 'When Models Cross the Border: Adapting IT Competencies of Business Managers', Proceedings of the ACM SIGMIS CPR conference on Computer personnel research.

Ekstedt, M., Jonsson, N,. Plazaola, L., Molina, E.S. and Vargas, N. (2005). 'An Organization-Wide Approach for Assessing Strategic Business and IT Alignment', PICMET conference.

Frisk, E. (2007). 'Categorization and overview of IT perspectives – A literature review.', Proceedings of the European Conference on Information management and evaluation, Monpellier, Academic Conferences Ltd..

Galliers R. D., (1993), IT strategies: beyond competitive advantage, Journal of Strategic Information Systems, vol. 2, no. 4, pp. 283-291.

Galliers, R.D., Merali, Y. & Spearing, L. (1994). 'Coping with Information Technology? How British Executives Perceive the Key Information Systems Management Issues in the Mid-1990s', Journal of Information Technology 9(3).

Gemmell, M., & Pagano, R. (2003). 'A Post-implementation Evaluation of a Student Information System in the UK Higher Education Sector', Electronic Journal of Information Systems Evaluation (EJISE), 6, 2, Academic Conferences ltd.

Goedvolk, H., van Schijndel, A., van Swede, V. & Tolido, R. (1997). 'Architecture', in D.B.B. Rijsenbrij (ed.) The Design, Development and Deployment of ICT Systems in the 21st Century: Integrated Architecture Framework (IAF), http://home.hetnet.nl/~daanrijsenbrij/progx/eng/contents.htm.

Grote, G. & Baitsch, R., (1991). 'Reciprocal effects between organisational culture and the implementation of an office communication system: a case study.', Behaviour of Information Technology 10 3, pp. 207–218.

Grover, V., Teng, J.T.C. and Fiedler, K.D., (1998). 'IS investment priorities in contemporary organizations', Communications of the ACM 41 2, pp. 40–48.

Henderson, J.C. & Venkatraman, N. (1993), 'Strategic alignment: Leveraging information technology for transforming organizations', IBM Systems Journal, Vol. 32, no. 1.

Hirschheim R. & Sabherwal R. (2001), 'Detours in the Path toward Strategic Information Systems Alignment: Paradoxical Decisions, Excessive Transformations, and Uncertain Turnarounds', California Management Review, 44(1), pp. 87-108.

IBM Corporation (1981). 'Business Systems Planning; Information Systems Planning Guide', IBM application manual.

Irani, Z. (2002). 'Information Systems Evaluation: Navigating through the problem domain', Information Management, 40(1): 11–24.

Kaplan, R.S. and Norton, D.P. (2004): 'Measuring the Strategic Readiness of Intangible Assets'. Harvard Business Review. 82(2): p. 52-63.

Kearns, G.S. & Lederer, A.L. (2004), 'The impact of industry contextual factors on IT focus and the use of IT for competitive advantage', Information & Management, Vol. 41, pp. 899-919.

Keen, P. (1991), 'Every Manager's Guide to Information Technology', Harvard Business School Press, Boston.

Kefi, H. (2002), 'IS/IT Evaluation: A Context-Based and Process-Oriented Perspective, Electronic Journal of Information Systems Evaluation (EJISE), 6, 1, Academic Conferences ltd.

Kitchell, S., (1995). 'Corporate culture, environmental adaptation, and innovation adoption: a qualitative/quantitive approach.' Journal of the Academy of Marketing Science Summer 23 3, pp. 195–205.

Leidner D. E., Carlsson S., Elam J. & Corrales, M. (1999). 'Mexican and Swedish managers' perceptions of the impact of EIS on organizational intelligence, decision making, and structure'. Decision Sciences, 30 (3)

Livonen, M., Sonnenwald, D. H., Parma, M., & Poole-Kober, E. (1998). 'Analyzing and understanding cultural differences: Experiences from education in library and information studies'. Proceedings of the 64th IFLA General Conference, Amsterdam, Netherlands.

Love P.E.D. & Irani Z. (2004). 'An exploratory study of Information Technology Evaluation and Benefits Management Practices of SMEs in Construction'. Information and Management, 43(2):227-242.

Luftman, J.N. (2003). Competing in the Information Age; Align in the Sand, Oxford University Press, NY.

Luftman, J.N. & Brier, T. (1999), 'Achieving and Sustaining Business-IT Alignment', California Management Review, Vol. 42, 1.

Luftman, J.N., Papp, R. & Brier, T. (1999), 'Enablers and Inhibitors of Business-IT Alignment', Communications of the Association for Information Systems, Vol 1, Article 11.

Luftman, J.N. (2000), 'Assessing Business-IT Alignment Maturity', Communications of the Association for Information Systems, Vol 4, Article 14.

Luftman, J.N. (2007), 'An Update on Business-IT Alignment: "A Line" Has Been Drawn.', MIS Quarterly, vol. 6 no. 3.

Maes, R., Rijsenbrij, D., Truijens, O. & Goedvolk, H. (2000), 'Redefining Business-IT Alignment through a unified framework', http://imwww.fee.uva.nl/~maestro/PDF/2000-19.pdf.

Martin, J. (1982). 'Strategic Data-Planning Methodologies', Prentice Hall.

McRary, J.W., (1995). 'Leveraging the power of information technology for sustained competitive success.', Engineering Management Journal 7 1, pp. 3–4.

Miles, R.E. and Snow, C.C. (1978). Organizational Strategy, Structure, and Process, New York: McGraw-Hill Book Co.

Niederman, F., Brencheau, J.C. and Watherbe, J.C. (1991). Information Systems Issues for the 1990s, MIS Quarterly 15(4): 475-500.

Morneau K. (2006). Presentation on the IT Security World Conference & Expo, San Francisco.

Nijland, M. (2004). 'Understanding the Use of IT Evaluation Methods in Organisations', London School of Economics, PhD Dissertation.

Parker, M.M., Benson, R.J. & Trainor, H.E. (1988). Information Economics: Linking business performance to information technology, Englewood Cliffs, NJ: Prentice-Hall.

Parise, S. and Henderson, J.C. (2001). 'Knowledge resource exchange in strategic alliances', IBM Systems Journal. 40(4): p. 908-924.

Png, I.P.L., Tan, B.C.Y. & Wee, K.L. (2001). 'Dimensions of national culture and corporate adoption of IT Infrastructure'. IEEE Transactions on Engineering Management, 48 (1), 36-45.

Poels, R. (2006), 'Beïnvloeden en meten van business – IT alignment' (in Dutch), Dissertation VU University Amsterdam, Amsterdam.

PriceWaterhouseCoopers (2005), European Survey on ICT Value Management, research report, http://www.pwc.com/extweb/onlineforms.nsf/docid/5164DFF81A6BCD9A80256FCB003336FF?opendocument.

Pyburn, P.J. (1983), 'Linking the MIS Plan with Corporate Strategy: An Exploratory Study' MIS Quarterly, Vol. 7, No. 2.

Reich, B.H. & Benbasat, I. (1996), 'Measuring the Linkage between Business and Information Technology Objectives.', MIS Quarterly, Vol. 20, No. 1, pp. 55-81.

Reich, B.H. and Benbasat, I. (2000): "Factors that Influence the Social Dimension of Alignment Between Business and Information Technology Objectives". MIS Quarterly. 24(1): p. 81-113.

Renkema T.J.W. & Berghout, E.W. (1996). 'Methodologies for information systems evaluation at the proposal stage: a comparative review', Information and Software Technology, Elsevier.

Sabherwal, R. & Chan, Y. E. (2001), 'Alignment Between Business and IS Strategies: A Study of Prospectors, Analyzers, and Defenders.', Information Systems Research, 12(1), pp. 11-33.

Segars, A.H. and Grover, V. (1998): 'Strategic information systems planning success: An investigation of a construct and its measurement'. MIS Quarterly. 22(2): p. 139-163.

Silvius, A.J.G. (2006) 'Does ROI Matter? Insights into the True Business Value of IT', in Electronic Journal of Information Systems Evaluation (EJISE), Academic Conferences ltd.

Silvius, A.J.G. (2007), 'Aligning IT strategy to business strategy in a multi business company', America's Conference on Information Systems (AMCIS), Denver.

Silvius, A.J.G. (2007b), 'Business & IT Alignment in Theory and Practice', 40th Hawaii International Conference on Systems Science (HICSS-40), Waikoloa, Big Island, HI, USA.

Silvius, A.J.G. (2007c) 'Exploring Differences in the Perception of Business & IT Alignment', in Communications of the IIMA (CIIMA), Volume 7 Issue 2, International Information Management Association Inc., San Bernadino CA.

Silvius, A.J.G. (2008) 'The Impact of National Cultures on Business & IT Alignment', in Communications of the IIMA (CIIMA), Volume 8 Issue 2, International Information Management Association Inc., San Bernadino CA.

Silvius, A.J.G. (2008b) 'The Business Value of IT; A Conceptual Model for Selecting Valuation Methods', in Communications of the IIMA (CIIMA), Volume 8 Issue 3, International Information Management Association Inc., San Bernadino CA.

Silvius, A.J.G. (2009) 'Alignment and strategy; the chicken or the egg?', 2nd Conf-IRM conference, AlAin, UAE.

Silvius, A.J.G. & Batenburg, R,. (2009) 'Future development of Project Management competences', 42nd Hawaii International Conference on Systems Science (HICSS-42), Waikoloa, Big Island, HI, USA.

Society of Information Management (2003, 2004, 2005, 2006, 2007, 2008), 'Execs provide insight into top management concerns, technology developments in new SIM survey', (http://www.simnet.org/Content/NavigationMenu/About/Press_Releases/PressReleases.htm).

Stefanoue, C.J. (2001), 'A framework for the ex-ante evaluation of ERP software', European Journal of Information Systems, 10, 204-215.

Stewart, R. & Mohamed, S. (2002). 'IT/IS projects selection using multi-criteria utility theory, Logistics Information Management, 15, 4.

Straub, D. W., Keil, P., & Brenner, A. (1997). 'Testing the technology acceptance model across cultures: A three country study'. Information & Management, 31 (1), 1-11.

Treacy, M. & Wiersema, F. (1996) The Discipline of Market Leaders, Addison Wesley Publishing Company.

Van Grembergen, W, & De Haes, S. (2008), 'Implementing information technology governance: models, practices, and cases.', ISBN 978-1-59904-924-3, IGI, Hershey, Pa.

Van Lier, J., & Dohmen, T. (2007).), 'Benefits management and Strategic Alignment in an IT Outsourcing Context', 40th Hawaii International Conference on Systems Science (HICSS-40), Waikoloa, Big Island, HI, USA.

Ward, J. & Peppard, J. (2002), Strategic Planning for Information Systems, John Wiley & Sons, Third Edition.

Weill, P. & Broadbent, M. (1998), 'Leveraging The New Infrastructure; How Market Leaders Capitalize on Information Technology'. Harvard Business School Press.

Weill, P. & Ross, J.W. (2004), 'IT Governance; How top performers manage IT decision rights for superior results.', Harvard Business School Press.

Weiss, J., Thorogood, A.& Clark, K. (2006) 'Three It-Business Alignment Profiles: Technical Resource, Business Enabler, and Strategic Weapon', Communications of the Association for Information Systems, Vol 18.

Whiting, R., Davies, J, & Knul, M. (1996). 'Investment appraisal for IT systems' in Investing In Information Systems: Evaluation and Management. Edited by Leslie Willcocks. Chapman and Hall.

Wieringa, R., Gordijn, J. & Eck, P. van. (2005), 'Value-Based Business-IT Alignment in Networked Constellations of Enterprises.' In: Proc. 1st International Workshop on Requirements Engineering for Business Need and IT Alignment (REBNITA 2005). Paris, August 29-30, 2005.

Yamamoto Krammer, M. (2003). 'IS Departments Must Grow With SMBs', Gartner Dataquest, New York.